

Case Studies in Geriatric Medicine

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Learning Objectives

1. Assess the impact of age-related changes in organ systems on presentation and treatment of common clinical problems in older patients (such as hypertension, falls, and weight loss) and
2. Apply different models of healthcare delivery that could have positive outcomes on certain geriatric syndromes (such as frailty)



Content

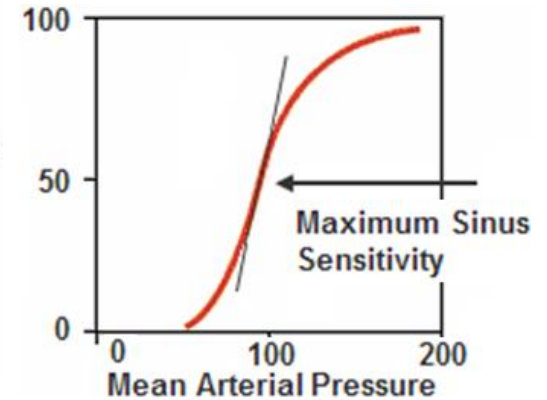
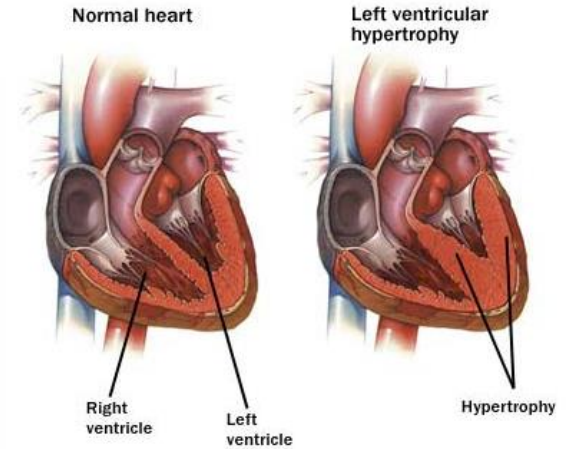
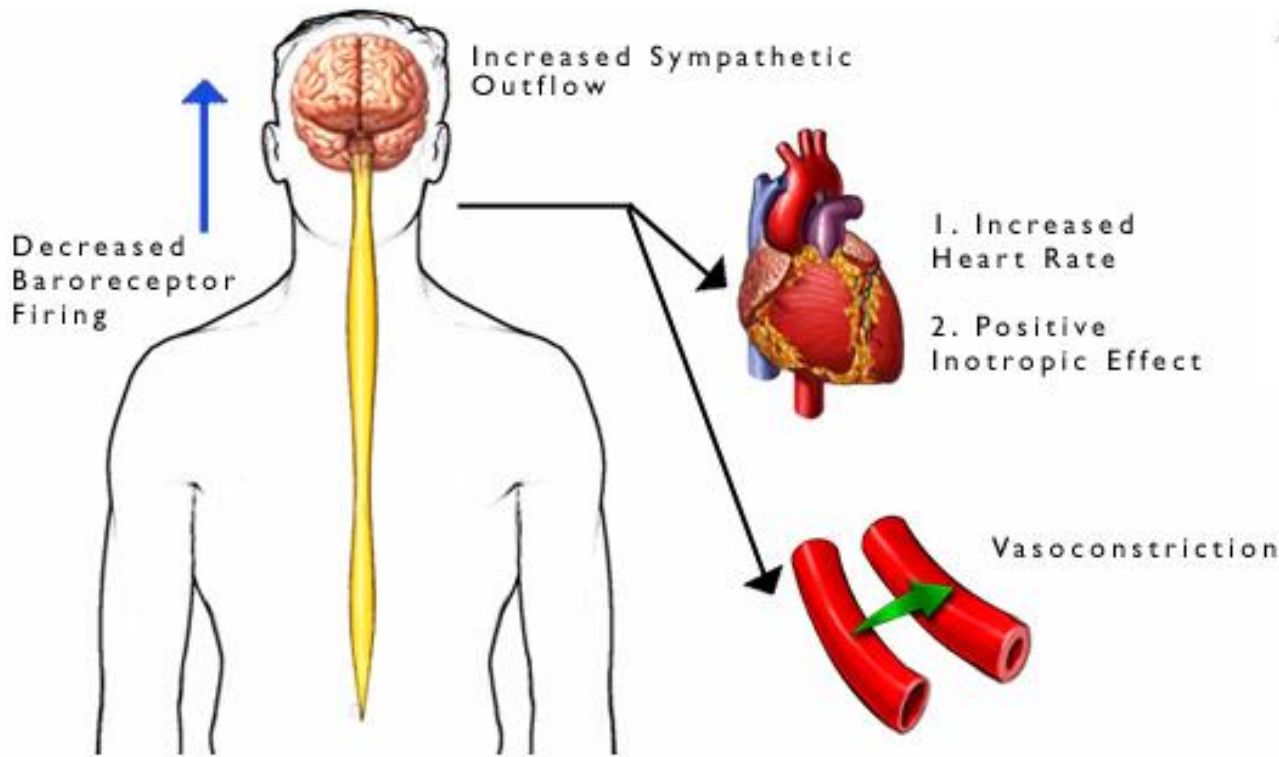
- **Geriatric Syndromes:** falls, delirium, frailty, dementia
- **Cardiovascular Topics:** age-related changes in BP regulation, hypertension management in the very old
- **Visual Impairment:** macular degeneration, glaucoma, cataract
- **Weight loss:** common causes in the elderly
- **Geriatric Models of Care**



- An 88-yr-old man comes to the office because he has been feeling more tired than usual, and yesterday he fell at home. He was hospitalized 2 months ago for pneumonia. He has history of Parkinson's disease, hypertension, & osteoarthritis. Medications: carbidopa/levodopa, hydrochlorothiazide, metoprolol. Which of the following is most likely to yield additional information useful for reducing his risk of falling?
 - A. Serum electrolytes, BUN, creatinine
 - B. Timed Up and Go test
 - C. Vitamin D level
 - D. Postural blood pressure
 - E. Carotid ultrasound



Baroreceptors: Response to Decreased BP (Standing)



- An 85 year old female comes to your Office for evaluation after a 3rd fall in the kitchen. She lives alone and takes donepezil for early Alzheimer's disease. Her caregiver asks for your advice regarding fall prevention. Physical exam is unremarkable. Which of the following is *most* likely to prevent future falls in this patient?
 - A. A trial of progressive resistance training
 - B. Home safety evaluation by OT
 - C. Transferring to Assisted Living facility
 - D. Changing the flooring in the kitchen
 - E. Recommending the use of a cane



- An 82-yr-old woman presents for evaluation. She tripped on the step at the entry to the kitchen at her daughter's house, fell & fractured her wrist. She has mild dementia, HTN, & early cataracts, & wears glasses with multifocal lenses. Medications: donepezil, metoprolol, & HCTZ. BP 140/70 flat, 130/74 standing. Timed Up and Go test is 12 seconds. Rest of exam is unremarkable. What would you recommend?
 - A. Treatment of postural hypotension
 - B. Use a cane or walker for better balance
 - C. Refer for balance training
 - D. Review of medications
 - E. Wear single-distance glasses while walking



- A 65-yr-old man has problems parking his van too close to the garage wall. Recently, while backing out, he hit the door and damaged the van and garage. He has driven a truck for the past 50 years with no incident. He has no trouble driving on the expressway. What is the *most* likely diagnosis?
 - A. Diabetic retinopathy
 - B. Macular degeneration
 - C. Cataract
 - D. Glaucoma



Vision in Macular Degeneration & Glaucoma



Normal vision



Macular degeneration



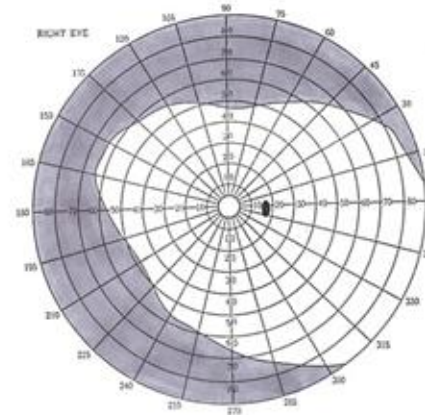
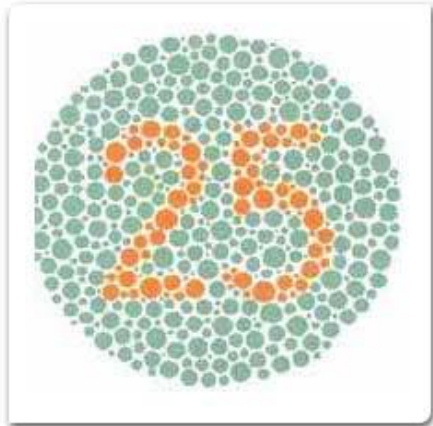
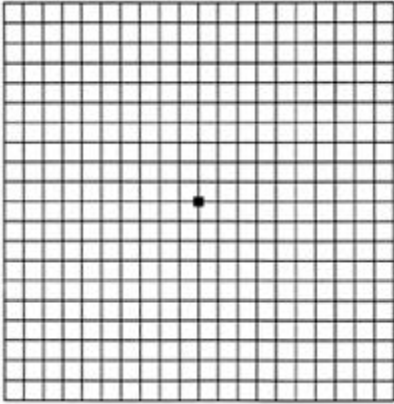
Glaucoma



Cataract (Glare)



Screening for Visual Impairment



- An 88 year old frail man with hypertension and osteoarthritis presents for routine follow-up. He has no new complaints. BP 145/80. Physical exam unchanged from previous visits. Medications: lisinopril & acetaminophen. Which of the following statements is TRUE?

A. Evidence supports lowering BP to 130/80 in this age group

B. HYVET (Hypertension in the Very Elderly Trial) showed reduction in total & stroke-related mortality using 150/80 as target BP

C. Hypertension has a higher population attributable risk for stroke than atrial fibrillation in octogenarians

D. Older patients with hypertension are at lower risk for orthostatic & postprandial hypotension

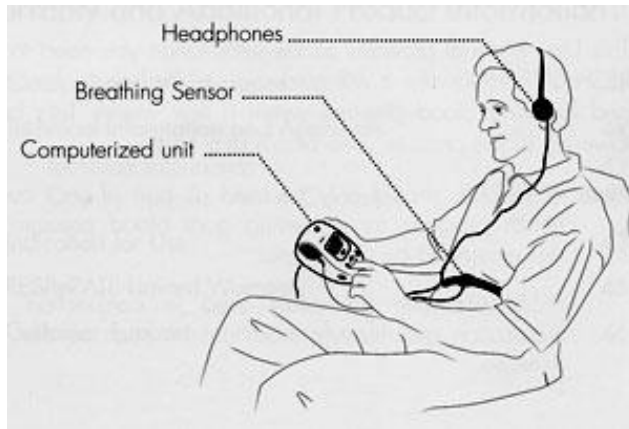


- Which of the following is TRUE regarding the use of HCTZ in older adults?
 - A. 26% of hyponatremia cases in patients ≥ 65 years are attributable to HCTZ
 - B. Older men are more susceptible to HCTZ-related side effects than women
 - C. HCTZ is less likely to cause orthostatic hypotension than dihydropyridine calcium channel blockers
 - D. HCTZ is more effective than ACE-inhibitors for BP control in patients with chronic-kidney disease



Blood Pressure Lowering Strategies

Breathing entrainment device



Tai Chi



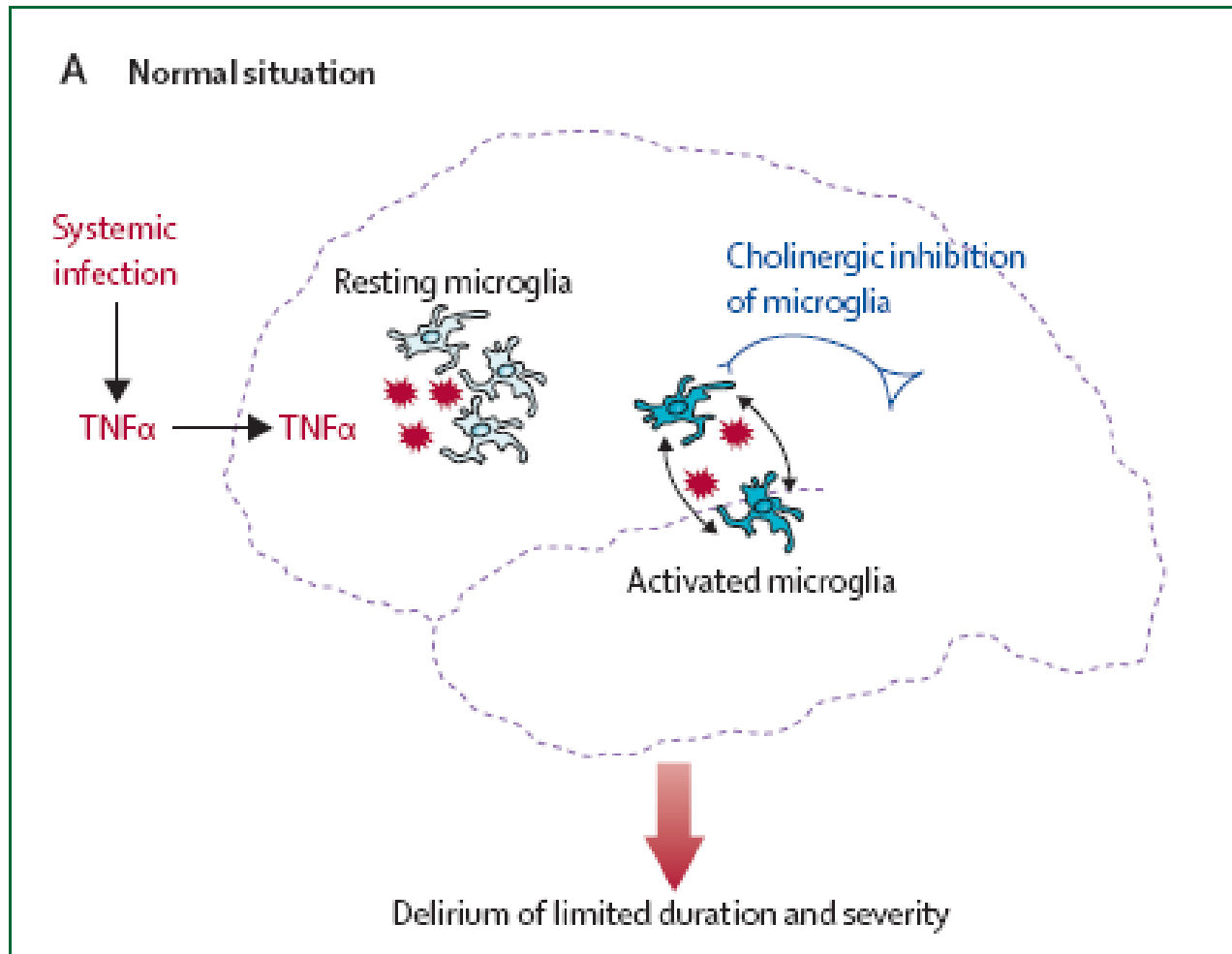
- Polyphenols in dark chocolate (improve insulin sensitivity)
- DASH (Dietary Approaches to Stop Hypertension) diet
- Coenzyme Q-10
- Other: Vegetarian diet, reduce alcohol/caffeine intake, increase intake of olive/fish oil, exercise, weight loss



- In defining new mechanisms for disease, it has been proposed that microglia play a key role in pathogenesis of delirium in the elderly. Which of the following is TRUE regarding this mechanism?
 - A. Microglia exhibit cholinergic activation
 - B. Microglia do not exhibit phagocytosis and antigen presentation
 - C. Activated microglia release cytotoxic mediators that can lead to long-term cognitive dysfunction
 - D. TNF- α released in systemic infection inhibits microglia



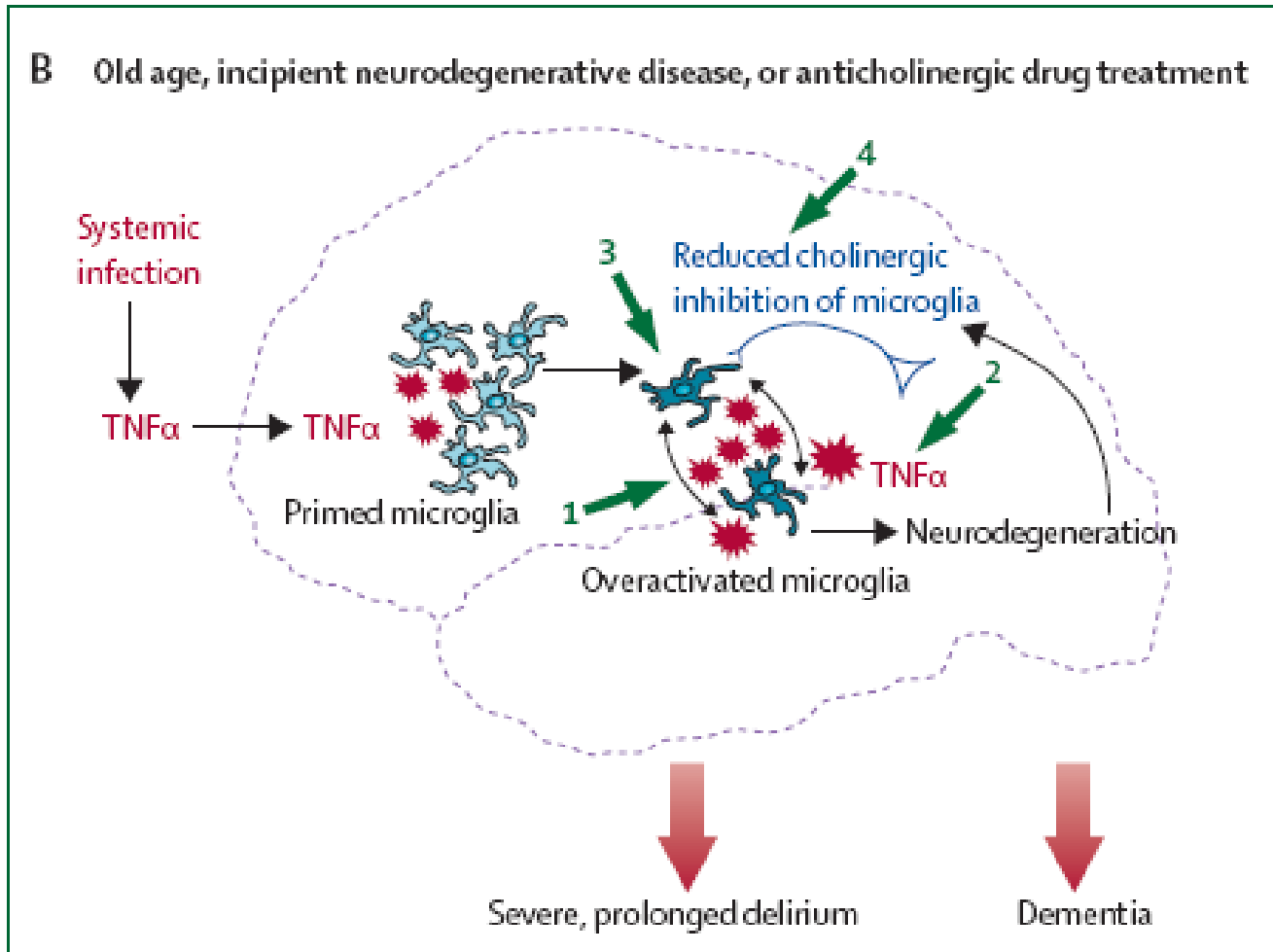
Systemic Infection & Delirium: When Cytokines & Acetylcholine Collide



Van Goal, The Lancet, Feb 2010.



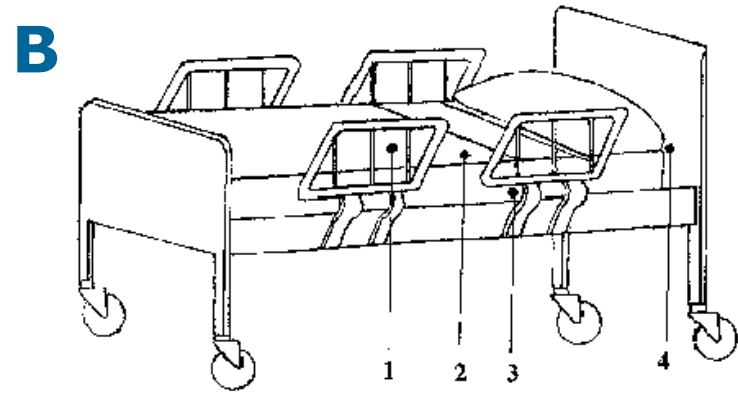
Systemic Infection & Delirium: When Cytokines & Acetylcholine Collide



Van Goal, The Lancet, Feb 2010.



- Which of the following would you recommend for an older patient with delirium and increased risk of falling?



C



D



- An 86-yr-old woman presents with fatigue, dizziness, occasional diarrhea & poor appetite. She lost 14 lb (9% of body weight) over the last 6 mo. History: atrial fibrillation, CHF (EF 40%) & hypertension. Medications: atenolol, digoxin, lisinopril & warfarin. On exam: BP 118/66 mmHg, HR 64. Rest of exam is unremarkable. Which of the following is *most* likely to identify the cause of weight loss?

- A. Chest X-Ray
- B. Serum digoxin level
- C. Fecal occult blood testing
- D. Geriatric depression scale
- E. Home visit



“Meals on Wheels”: A Mnemonic for Common Treatable Causes of Unintentional Weight Loss in the Elderly

- M** Medication effects
 - E** Emotional problems, especially depression
 - A** Alcoholism
 - L** Late-life paranoia
 - S** Swallowing disorders
 - O** Oral factors (e.g., poorly fitting dentures, caries)
 - N** No money
 - W** Wandering and other dementia-related behaviors
 - H** Hyperthyroidism, hypothyroidism, hyperparathyroidism, hypoadrenalism
 - E** Enteric problems
 - E** Eating problems (e.g., inability to feed self)
 - L** Low-salt, low-cholesterol diet
 - S** Social problems (e.g., isolation, inability to obtain preferred foods)
-



- An 83-yr-old female presents with weight loss of 10 lb over 18 months (7% of body weight). Feels everything she does is an "effort," and has begun using her arms to lift herself from the chair. Physical examination is significant for slow, steady gait. Depression screening is negative. CBC, BUN, creatinine, electrolytes, TFTs & LFTs are normal. Frailty is diagnosed. Which of the following is *most* likely to prevent further decline in function?
 - A. Trial of methylphenidate
 - B. Increase social interaction
 - C. Refer for resistance-training exercise program
 - D. Start protein supplements with meals
 - E. Refer to Hospice



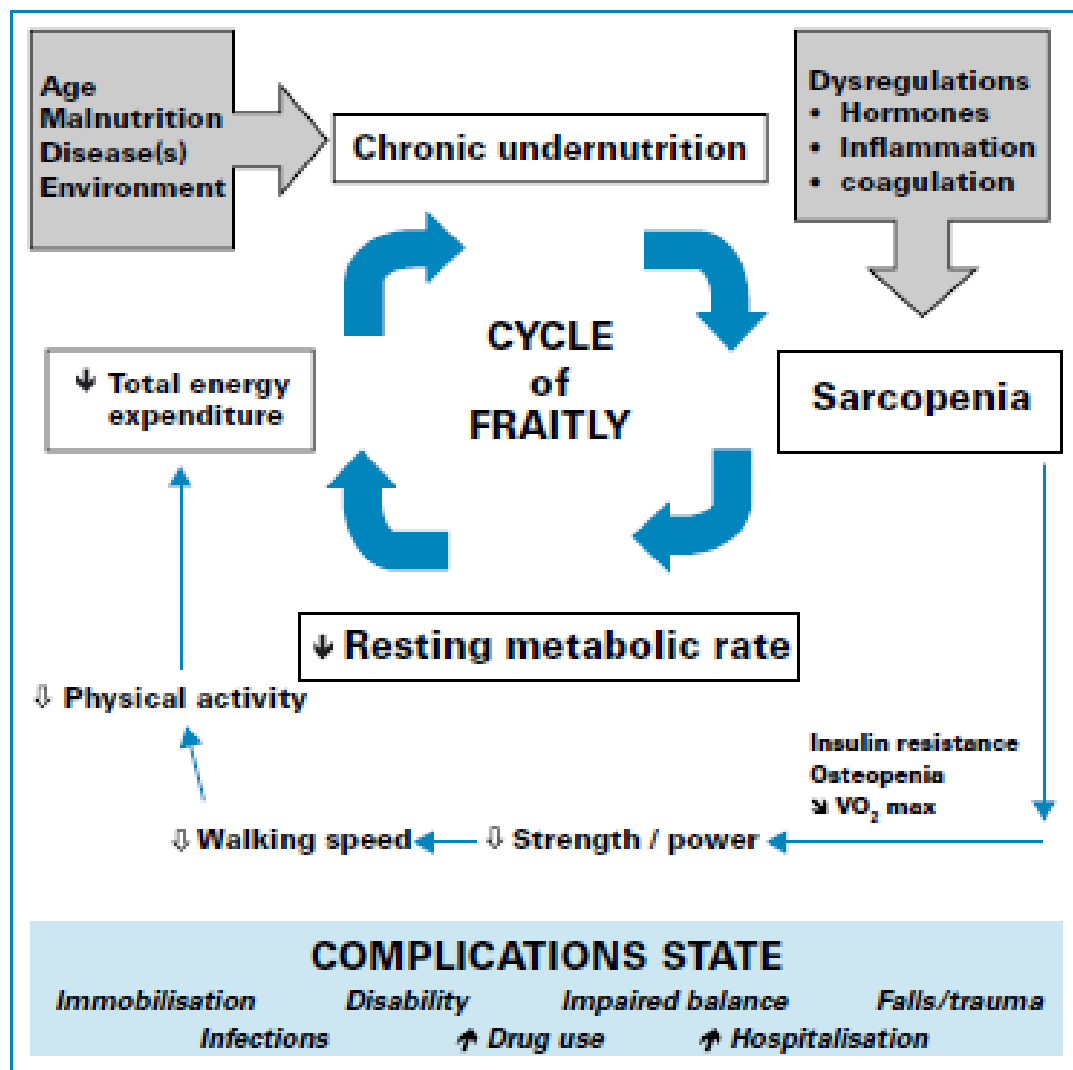


Figure 1. The cycle of frailty (Adapted from Fried LP, et al. J Gerontol 2001).

- A 75 year-old male with early Alzheimer's disease (MMSE 20/30) could not tolerate treatment with acetylcholine esterase inhibitors due to adverse effects. Which of the following has been shown to produce at least as much cognitive benefit as cholinesterase inhibitors in patients with Alzheimer's disease?
 - A. Progressive resistance training (strength)
 - B. Balance exercises
 - C. Flexibility and stretching
 - D. Moderate intensity aerobic exercise (150 min/week)
 - E. Evidence is lacking for such recommendation



Physical Activity & Cognitive Function

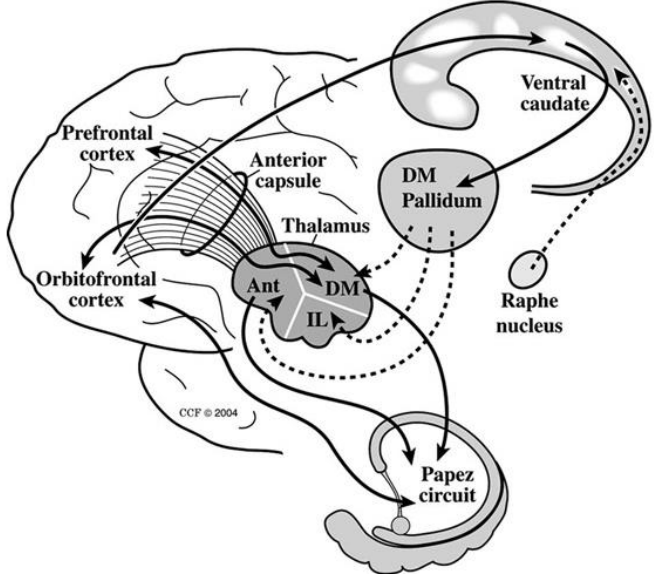
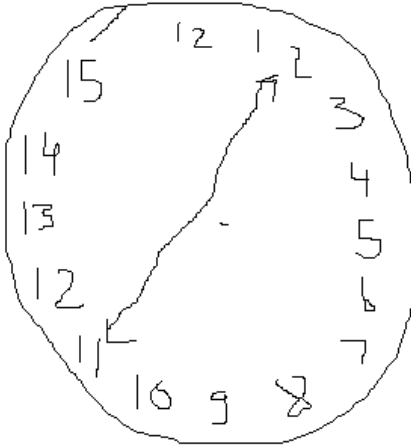
1. Baker M, Kennedy D, Bohle P, et al. Efficacy and feasibility of a novel tri-modal robust exercise prescription in a retirement community: a randomized controlled trial. *J Am Geriatr Soc.* 2007;55(1):1-10.
2. Larson E, Wagner L, Bowen J, et al. Exercise is associated with reduced risk for dementia among persons 65 years of age and older. *Ann Intern Med.* 2006;144(2):73-81.
3. Lautenschlager N, Cox K, Flicker L, et al. Effect of physical activity on cognitive function in older adults at risk for Alzheimer disease. *JAMA.* 2008;300(9):1027-1037.



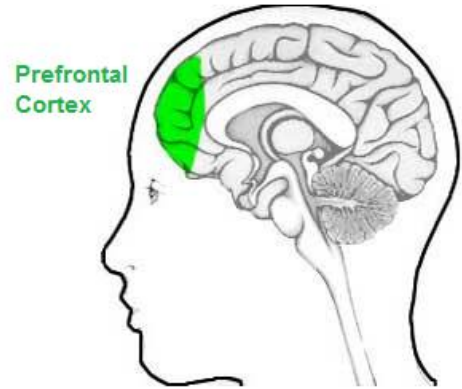
- A 70 year-old male reports progressive difficulties with concentration & performing complex tasks that started 1 year ago. History: atrial fibrillation, insomnia, hypertension, & diabetes. Medications: warfarin, trazodone, lisinopril & glipizide. Physical exam: BP 145/90, BMI 39. Clock-draw test is abnormal; 3/3 word-recall at 1-min. Rest of exam is unchanged from a year ago. Which of the following is the *best* next step in the management of this patient?
 - A. Start donepezil 5 mg daily
 - B. Refer for Neuropsychological testing
 - C. Schedule a sleep study
 - D. Obtain head MRI
 - E. Repeat cognitive testing in 6 months



Executive Dysfunction: Prefrontal Cortex



Executive Function



- An 80 year old female who lives alone comes for a follow-up visit. She has been progressively declining in function over the past year. Her gait has become more unsteady. She was hospitalized for a fall 3 months ago; complete work-up (including post-discharge 30-day cardiac monitor) was negative. She reports increasing difficulty with getting in and out of the bathtub and going up the stairs. On exam, she has a slow gait and she is unable to stand up from chair with arms crossed. Folstein MMSE 28/30. Which of the following interventions can prevent further functional decline in this patient?
 - A. Physical therapy in a rehabilitation center
 - B. Home-based intervention program
 - C. Starting an antidepressant
 - D. Referral to a Nutritionist



Home-Based Intervention Program

The New England Journal of Medicine

A PROGRAM TO PREVENT FUNCTIONAL DECLINE IN PHYSICALLY FRAIL, ELDERLY PERSONS WHO LIVE AT HOME

THOMAS M. GILL, M.D., DOROTHY I. BAKER, PH.D., R.N.-C.S., MARGARET GOTTSCHALK, P.T., M.S.,
PETER N. PEDUZZI, PH.D., HEATHER ALLORE, PH.D., AND AMY BYERS, M.P.H.

1068 · N Engl J Med, Vol. 347, No. 14 · October 3, 2002 · www.nejm.org



Take Home Points

1. Some age-related physiological changes can have significant impact on disease management and treatment outcomes in older patients: for example, age-related baroreceptor dysfunction could lead to orthostatic hypotension and falls when tight BP control is attempted
2. Some geriatric syndromes, such as frailty, require a comprehensive model of healthcare delivery in order to improve outcomes (interdisciplinary, home-based, holistic, etc.)



Take Home Message: Successful Aging

Jeanne Calment at 122 years of age

